

## NOTES AND ABSTRACTS

THE CLIMATE OF COIMBRA<sup>1</sup>

By Prof. ANSELMO FERRAZ DE CARVALHO

Professor Carvalho has summarized the meteorological observations made at the Observatory of Coimbra during the 55 years 1866-1920 and presents his results in two parts. The first treats of the elements of climate of Coimbra as defined by the entire observational period; the second treats of the temperature of the air in very great detail, and the statistics (the tables of data) give the daily means, the daily maxima and minima for the 50-year period, 1867-1916. Daily means in groups of 5 days each are also presented.

Coimbra, N. latitude 40° 12', W. longitude 8° 25', altitude 141 meters, occupies a central position in the western margin of the Iberian Peninsula, and its climate therefore represents a form intermediate between that of the northern and the southern portions of this peninsula. The latter is very much under the influence of the semi-permanent area of high pressure centered over the Azores, and we should therefore expect rather strong climatic variations, notwithstanding its marine exposure on the west.

The series of temperature observations is quite homogeneous throughout the entire period and the means have been calculated from the 24-hour readings.

The averages of the annual means in groups of 20, 30, 40, 50, and 55 years are as follows:

	°C
1866-1885.....	14. 82
1866-1895.....	14. 70
1866-1905.....	14. 72
1866-1915.....	14. 68
1866-1920.....	14. 66

Thus showing first a slight rise and then in the last half of the record slowly diminishing temperature. The annual mean may be taken as 14.7° C.; the lowest yearly mean was in 1889 with 13.56° and the second lowest annual mean was 13.74° in 1917; the highest annual means were in 1881 and 1899 with 15.85° and 16.20°, respectively; hence the coldest years were but about 1° C. below the mean and the warmest years 1.5° above the annual mean, or an amplitude of 2.5° C. (4.5° F.).

Discussing sun spots and air temperatures, Professor Carvalho observes that the generally recognized relation of sun spots to terrestrial temperature—maximum spottedness of the sun corresponding to low temperature and the opposite—is not confirmed by the Coimbra observations. He states (p. 42):

With exception of the maximum of 1883.9, 1894.1, and 1917.8 which correspond to minimum temperatures, the variations in the number of spots are better represented by a curve parallel to and not opposite to that of the variations of temperature \* \* \*.

The record of precipitation shows two groups of maximum rains and one of minimum, which, considering Coimbra's maritime exposure, is in opposition to Brückner's rules. The years of heavy precipitation were 1879-1881 and 1914-1916; the years of deficient rains were 1896-1898. The last-named series of dry years was preceded by the year of greatest precipitation in the entire series. Here again the tendency of one extreme being immediately followed by another in the opposite direction is manifest.

Students of weather periodicities will find valuable material in Professor Carvalho's work.—A. J. H.

<sup>1</sup>The Climate of Coimbra, Anselmo Ferraz de Carvalho, Lisbon, 1922.

## THE RANGE OF ATMOSPHERICS

[Reprinted from Nature, May 7, 1927]

The distances over which an atmospheric may produce disturbance of broadcast reception was discussed. The committee organized experiments in which observers in the British Isles, Norway, Germany, France, Spain, Morocco, and Madeira recorded disturbance of broadcast talks, while the sources of the atmospherics were identified by radio position finding by the organization set up in the Department of Scientific and Industrial Research on the advice of its Radio Research Board. Many of the sources were found to lie in regions of meteorological disturbance. Atmospherics from beyond the Azores have disturbed the reception of Daventry's signals in Paris and of London's signals in Aberdeen, and a thunderstorm at Rome disturbed reception in Spain, France, Madeira, the British Isles, and Norway. Many atmospherics are heard at distances exceeding 1,800 miles from their sources, and may reach at least 4,500 miles. There is no evidence of the presence of many atmospherics with a short range of disturbing effect.—R. A. Watson Watt, at meeting Royal Meteorological Society March 20, 1927.

## PRELIMINARY OBSERVATIONS ON SOLAR ACTIVITY AND RADIO RECEPTION

[Laboratory for Special Radio Transmission Research, conducted jointly by the Bureau of Standards and the American Section of the International Union of Scientific Radio Telegraphy]

Recently a study of our observational data has been begun in regard to a possible relationship between radio

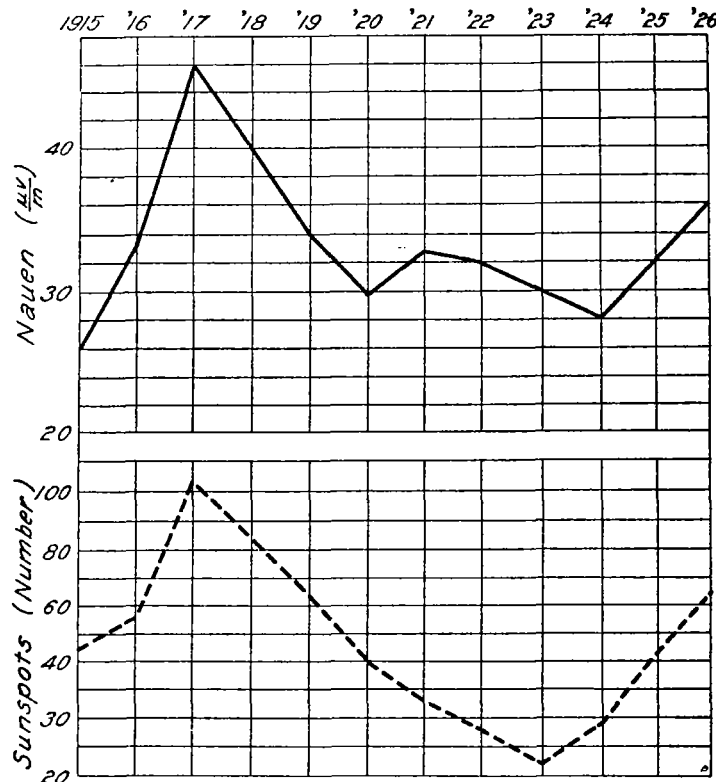


FIG. 1.—Annual average signal intensity of Nauen (AGS) and sun-spot numbers

signal strength and solar activity. For this purpose we have rough shunted telephone observations on Nauen as

received in Washington, beginning in 1915, and more accurate measurements since 1922. Some preliminary results are shown in the figures.

In Figure 1 the annual averages of sun-spot numbers and of daylight signal strength of Nauen, reduced to a constant antenna current, from 1915 to 1926, are given. The earlier years of the Nauen reception curve have little claim to accuracy, but it is certain that there was a reception maximum in 1917 and low values from 1920 to 1924.

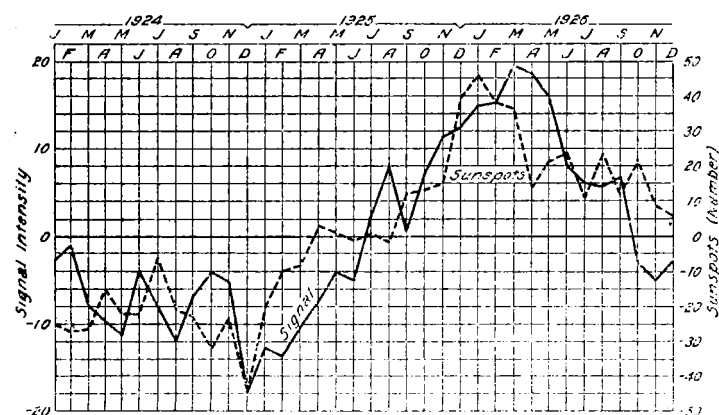


FIG. 2.—Monthly deviation from three-year monthly averages of sun-spot numbers and signal (LY, KET, AGS, FU, ET, 10 a. m. and 3 p. m.)

Figure 2 shows the relationship between the monthly average sun-spot numbers and the deviations of the individual monthly daylight means of several stations from the averages of the corresponding months for the three years—1924, 1925, and 1926. The deviations rather than the monthly averages are used to eliminate the rather large seasonal variations. These curves of sun spots and signals, while not following each other exactly from month to month, appear to show a quite definite positive correlation between solar activity and strength of long-wave daylight radio transmission averaged over long periods.—*L. W. Austin.*

## INTERRELATIONS OF PRESSURE ANOMALIES OVER THE EARTH<sup>1</sup>

By F. M. EXNER

[Reprinted from Science Abstracts, April, 1927, sec. No. 917]

The author tabulates as in a previous paper [see Abstract 1836 (1925)] the mean monthly pressure anomalies for the winter and summer half-years for 71 stations scattered over the world. The pressure at Obdorsk is correlated with the other places, and a region between 40° and 60° N. quite round the earth has with this place almost a zero correlation. Eight stations on or near this area are chosen and their pressure anomalies for the winter half-year correlated with the whole of the 71 stations. A shorter method of arriving at the results is then examined, using an extreme positive or negative anomaly at each of the 8 selected stations and finding the corresponding values for all the others. The results are exhibited in a series of charts and explained in detail. The method gives the influence of abnormal pressure at one place on the pressure at other parts of the earth. The possible dynamical and thermal considerations which may

produce these results are examined and applied in several cases. Polar regions are mostly places of maximum influence, while southwards over the sea there are also places of large correlation. Continental regions have a small influence. Next, assuming particular anomalies at 2 selected stations, the author considers how the average pressure distribution is produced, and gives tables and graphs of his tests for six combinations of two places in the Northern Hemisphere when their pressure anomalies are of the same sign and of opposite sign, using again the winter half-year. For a clearer picture of the origin of the pressure distribution over the earth a longer series of observations than 30 years would be necessary, and combinations of pressure anomalies at three places should then be taken, with also due consideration to the temperature anomalies.—*R. S. R.*

## WEATHER BUREAU STAFF MEETINGS, 1926-27

By EDGAR W. WOOLARD, Secretary

The regular biweekly meetings of the scientific and technical staff of the Central Office of the United States Weather Bureau, initiated in the autumn of 1923, have been continued on the same plan as heretofore during the winter of 1926-27. Following is a list of the discussions. (Asterisks denote speakers not officially connected with the Weather Bureau.) Meetings during previous seasons have been reported in the MONTHLY WEATHER REVIEW, 1924, 52, 35-36, 166; 1925, 53, 264; 1926, 54, 215-216.

October 6, 1926

*E. W. Woolard.* Seiches in lakes, and the application of Chrystal's theory to Lake Vetter.

\**C. G. Rossby.* Remarks on the influence of winds on lake levels.

October 20, 1926

*W. R. Gregg and L. T. Samuels.* National and international sounding balloon explorations; preliminary results of the sounding balloon observations made at Royal Center, Ind., during May, 1926.

November 3, 1926

\**L. Gorczynski.* Demonstration of thermoelectric radiation instruments, and some solar radiation measurements obtained in the Sahara Desert.

November 17, 1926

*H. H. Kimball.* A review of Ångström's paper on "Radiation and Climate."

December 1, 1926

*E. W. Woolard.* The thermodynamical relations of the free atmosphere.

*L. T. Samuels.* The graphical reduction and representation of aerological data at the Lindenberg Observatory.

*W. R. Stevens.* The tephigram.

December 15, 1926

*W. J. Humphreys.* The tornado.

January 12, 1927

*W. C. Haines.* The Byrd Arctic expedition.

*S. P. Fergusson.* The University of Michigan expedition to Greenland.

January 26, 1927

*R. H. Weightman.* The application of the polar front theory to American weather maps.

<sup>1</sup> Akad. Wiss. Wien. Ber. 135. 2a. No. 7-8, pp. 333, 355, 1926.